Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	}	
	}	
Revision of Part 15 of the Commission's	}	
Rules Regarding Ultra-Wideband	}	ET Docket No. 98-153
Transmission Systems	}	

Reply Comments of Multispectral Solutions, Inc.

Multispectral Solutions, Inc. (MSSI) is pleased to submit these reply comments in response to the Notice of Proposed Rule Making (NPRM), FCC 00-163, in the above referenced proceeding.

With more than a decade of experience in the development of ultra wideband (UWB) systems for communications, radar and geopositioning – including more than 40 UWB contract awards from the U.S. Government – MSSI is an established leader in this rapidly emerging field. This technological leadership stems from "real world" experience and the successful demonstration of a wide variety of UWB systems in demanding operational environments.

As an industry leader and active proponent of UWB technology, MSSI is keenly aware of the key issues surrounding the current rule making. On one hand, the UWB industry needs FCC approval to permit the commercialization of a technology that has obvious benefit to the public. On the other, critical industries which rely upon GPS and telecommunications services have voiced serious concerns about the potential for interference to their products and services. While expressing these concerns, these same industries have also unanimously agreed that UWB technology may have significant technological merit.

Unfortunately, a great deal of angst has been created by unsupported claims of non-interference on the part of a few UWB proponents. Recently, a UWB CEO stated that *"If you're a regulator, how can you regulate a technology that you've never seen before? If they see what it's like, they see the benefits, they see above all the lack of interference with other systems, then they will understand this is beneficial."*[1] Irv Rappaport of Aurigin Systems was quoted in *USA Today* (October 6, 1999) as stating *"They should let it (UWB) rip¼then if there is a problem, regulate it."*

However, there *is* a problem. Certain implementations of UWB have been shown to

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[1] Ralph Petroff quoted in "Time Domain tries for buzz on invention", **Huntsville Times**, Brett Davis , Wednesday September 29, 1999.

significantly interfere (or "interact") with GPS, TV and PCS/PCN. These facts have resulted in a major effort by the National Telecommunications and Information Administration (NTIA) and others to understand how and why these systems are interfering. Tests are being conducted under controlled conditions to permit repeatable and reliable measurements. While there are arguments about the need for “real world” testing, controlled testing by certified laboratories is how Part 15 devices are allowed into the marketplace; and it is not obvious that UWB devices should be granted a less stringent testing procedure.

Thus, the current situation has resulted in two opposing viewpoints. UWB proponents want and need a prompt FCC rule making for commercialization, and those opposed are demanding more testing to alleviate concerns about widespread interference to their existing products and services.

Taking into account both opposing viewpoints, and realizing that a potentially endless dialogue about what constitutes valid test results might forever prevent an FCC rulemaking, MSSI proposes the following “win-win” solution:

1. Permit the initial use of unlicensed UWB devices in the frequency range *above* 3.1 GHz (with special consideration to the unrestricted band from 5.46 to 7.25 GHz);

2. Permit UWB operation in bands above 3.1 GHz at power levels commensurate with existing Part 15 devices (i.e., 1 Watt peak with +6 dBi antenna gains), but relax the peak-to-average ratios from the current 20 dB limitation to the proposed 60 dB limit to properly reflect the low duty cycle advantage of a well designed UWB emitter;

3. Continue with UWB testing and an extended comment period for consideration of UWB operation *below* 3.1 GHz; and continue to monitor the waivers granted to Time Domain, U.S. Radar and Zircon as they shed light upon the effects of UWB systems in this frequency range; and,

4. Alternatively, consider licensing for applications requiring frequencies below 3.1 GHz.

This approach clears the way for a prompt FCC ruling permitting UWB commercialization, while adequately protecting key wireless and safety-of-life/safety-of-flight services below 3.1 GHz – GPS, AM/FM/TV broadcast, PCS/PCN, emerging 3G wireless and others.

One UWB proponent has argued that approving UWB *above* a certain frequency band will make UWB implementation impractical. However, as the leader in fielding operational UWB systems, MSSI has clearly demonstrated that such is not the case. Indeed, the majority of UWB proponents have shown the capability to operate at frequencies above 3.1 GHz:

1. XtremeSpectrum, in its NPRM response, stated that their maximum frequency occurs at 4 GHz with an occupied bandwidth of 2-10 GHz;

2. Fantasma Networks, in its NPRM response, stated that UWB communications systems do not require frequencies below 2 GHz; and,

3. Time Domain has disclosed in recent patents[2] the ability to filter their transmissions and had been an early advocate (while doing business as Pulson Communications) of UWB systems with a center frequency of 5.5 GHz.[3]

While higher frequency operation may require some additional engineering effort, it is a far better alternative than interference to safety-of-life and other key commercial spectrum users. Obviously, there is also a tremendous cost to all parties with a continued delay in the rule making process.

Ironically, one major UWB proponent opposed to higher frequency operation has failed to sell a single UWB device under the waiver granted to it by the FCC,[4] yet this same company now argues for "real world" measurements of UWB by the NTIA. Such sales of UWB equipment were an essential component of the waiver.. Indeed, the FCC had specifically stated that *"¼a waiver will afford a real-world test of a new technology. The results of this test will create a record that will aid the Commission in making decisions regarding allowing ultra-wideband applications on a broader scale."*[5]

Thus, the purpose of the waiver was not only to permit the sale of equipment below 2 GHz; but also to provide a mechanism by which the FCC could further evaluate the potential of such equipment to coexist with existing services. Interestingly, a number of police and fire departments have recently written the FCC highlighting the immediate need for such technology, despite the fact that such equipment has been available for sale under the existing waiver to Time Domain.

In conclusion, the FCC has literally bent over backwards to accommodate a few UWB companies that continue to do battle against some of the largest commercial and Government organizations in our country. MSSI believes that it is in the public interest for the FCC to alleviate the concerns of the airlines, GPS, and telecommunications industries by issuing a rule making that prohibits UWB emissions from operating in their

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[2] Time Domain Corporation PCT/US99/06218 dated 30 September 1999; and TDC U.S. Patent 5,995,534 dated 30 November 1999

[3] Pulson Communications comments on Apple Computer's Petition for Rule Making "NII" band dated May 24, 1995.

[4] A copy of the FOIA response letter from Mr. Dale Hatfield, FCC Chief –Office of Engineering and Technology, is provided in the attached Appendix.

[5] Mr. Dale Hatfield, Chief, FCC Office of Engineering and Technology, in letter of waiver granted to Time Domain Corporation on 29 June 1999.

frequency bands. Staying above 3.1 GHz is the *right* decision, and MSSI trusts that the FCC will move quickly to enable our industry while protecting the safety and livelihoods of others.

Respectfully submitted,

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CN: 20-221
1300F1

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Attention: Dr. Robert J. Fontana

Gentlemen:

This is in reply to your facsimile dated August 22, 2000, which invoked the Freedom of Information Act (5 U.S.C. 552)(FOIA). Your facsimile requests a copy of all grants of Certification given to Time Domain Corporation for ultra wideband equipment. In addition, you also request a copy of all records of sales provided to the Commission regarding this equipment.

The copy of the Grant of Equipment Authorization may be obtained by going to the Commission website on the Internet at www.fcc.gov. At that site, click on E-Filing, and click on OET Equipment Authorization Electronic Filing, and click on Grantee Search. Enter "time domain" in the Grantee Name box and click on Start Search. The search results will return NUF as the Grantee Code for Time Domain. Click on Return to Query Form, click on Generic Search and type NUF into the Grantee Code Box and click on Start Search.

Information on the one grant that was issued to Time Domain will be displayed. Under the Display Grant heading, click on View Grant and a copy of the grant will be displayed. You may print a copy of this grant using your web browser. The application form and the exhibits that were submitted to obtain the Grant of Certification for this device are also viewable on this website by clicking on either View Form or View Exhibits.

Time Domain has informed me that this unit is a prototype unit for demonstration purposes only, and not for sale. We currently have no documentation regarding sales of Time Domain equipment.

I hope this is responsive to your inquiry, and will assist you in any future need for information. If you have any additional questions about this matter, please contact Mr. Richard Fabina by telephone at (301)362-3021.

Sincerely

Dale N. Hatfield

Dale N. Hatfield
Chief
Office of Engineering and Technology